

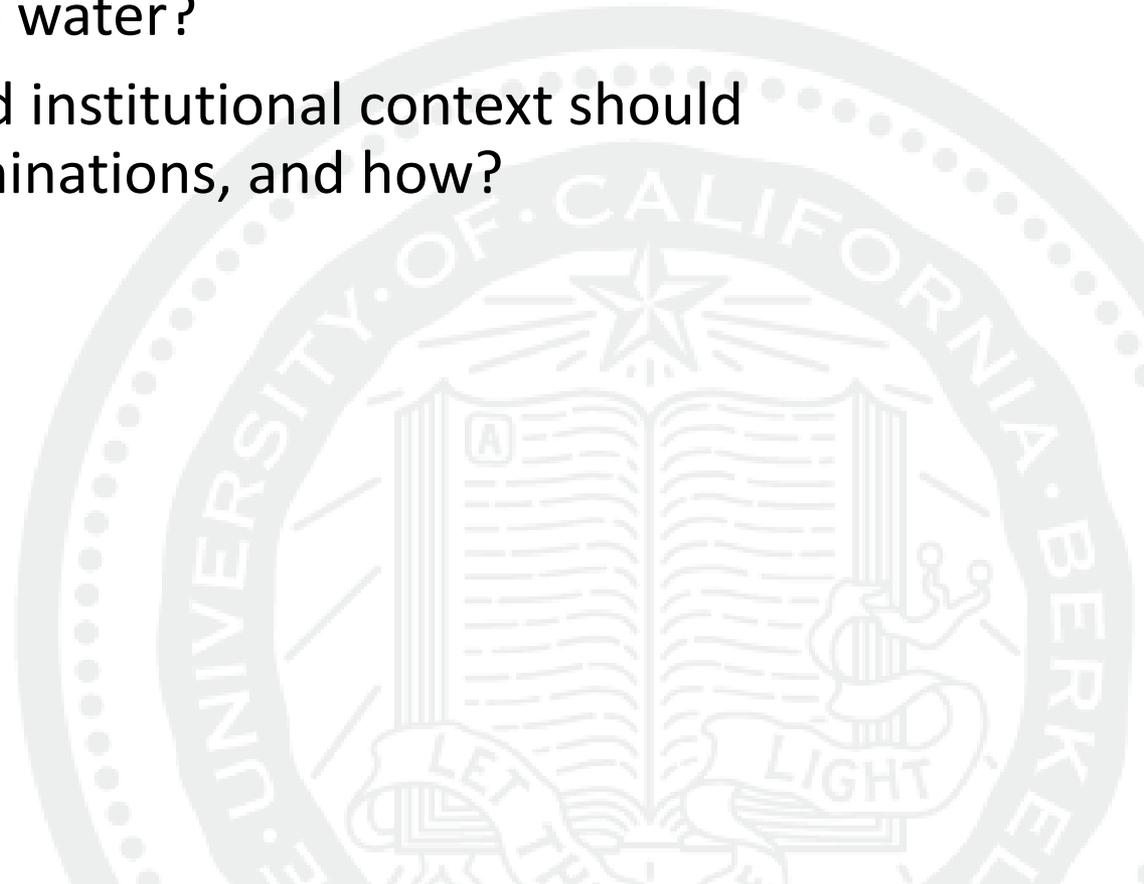
Navigating Groundwater-Surface Water Interactions under the Sustainable Groundwater Management Act



Alida Cantor, Dave Owen, Thomas Harter, Nell Green Nysten, and Michael Kiparsky

Motivating questions

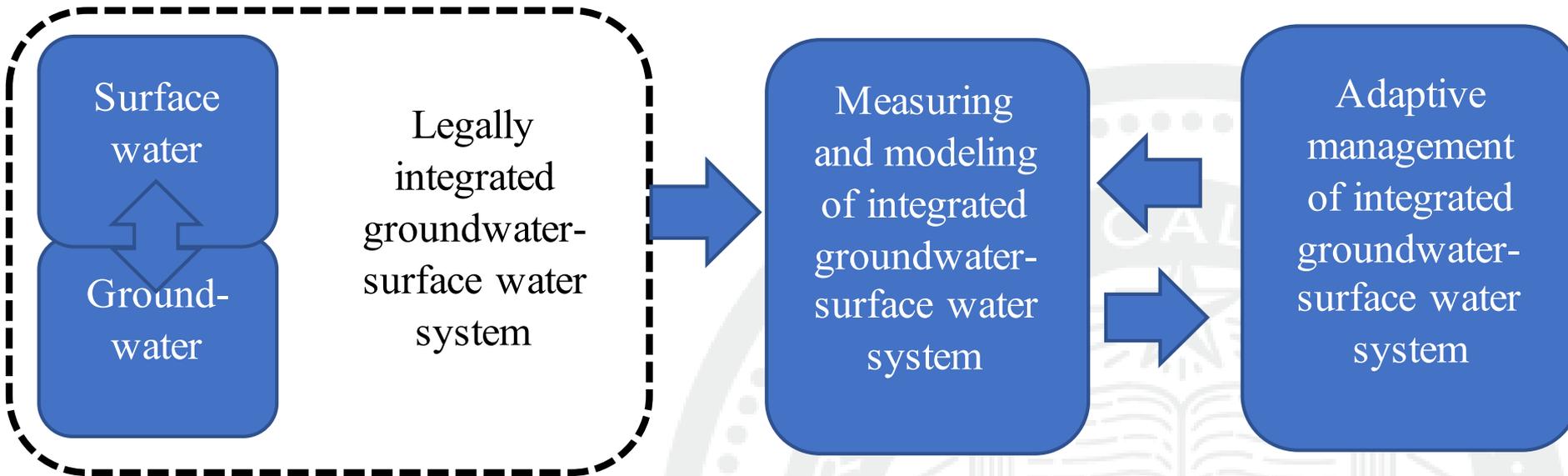
- How should GSAs define and avoid significant and unreasonable adverse impact on beneficial uses and users of interconnected surface water?
- What broader legal and institutional context should influence these determinations, and how?



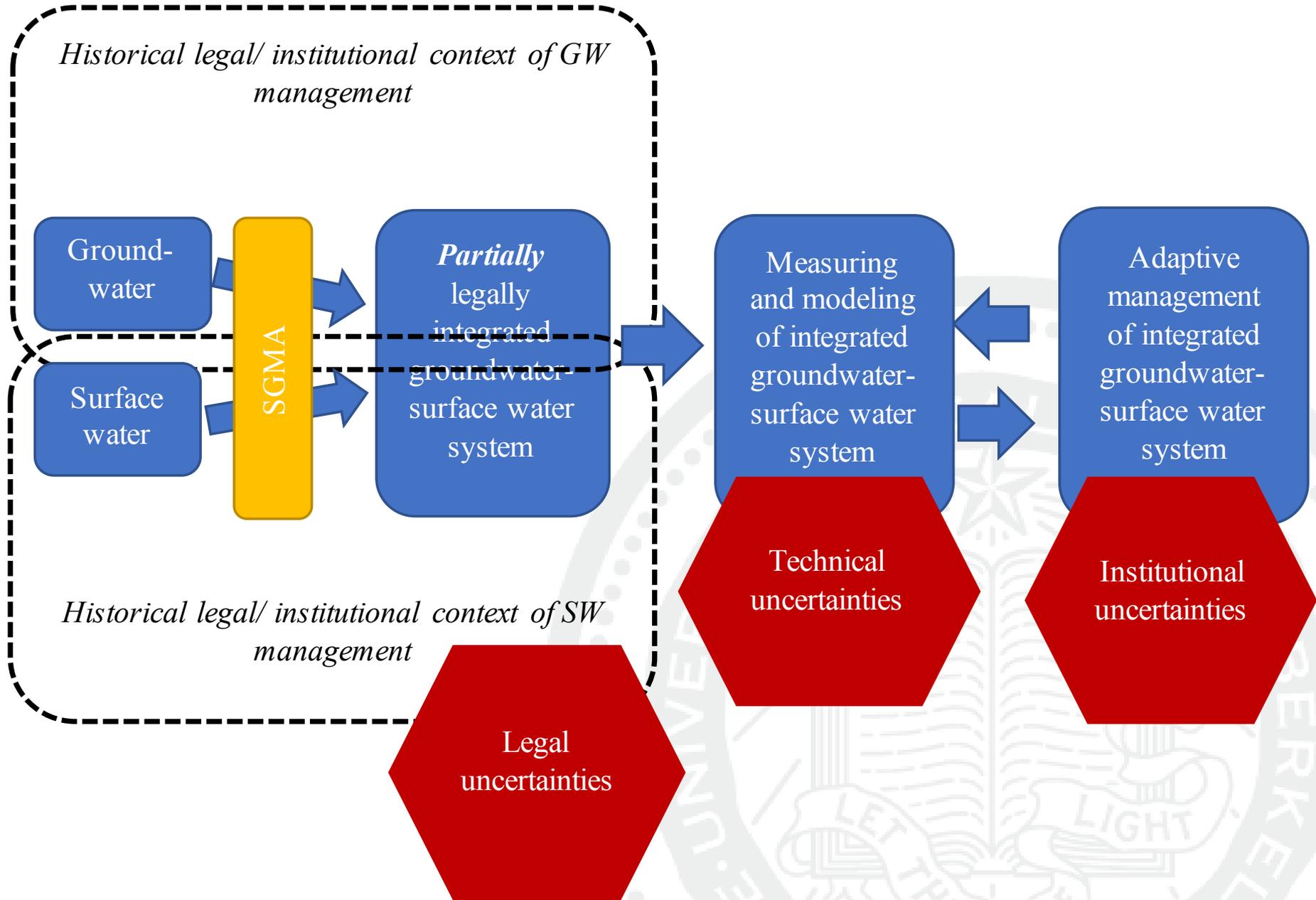
Conclusions: practical implications

- **Technical knowledge:** GSAs must strive to understand how groundwater management affects surface water and its uses.
- **Legal knowledge:** GSAs will need to consider how groundwater rights, surface water rights, environmental laws and regulations, and other relevant legal principles interact.
- **Decision-making under uncertainty:** GSAs must decide what is significant and unreasonable, and these local decisions will intersect with other laws.
- **Planning responsibility under risk:** GSAs will need to develop management plans and make decisions despite substantial legal and technical uncertainties
- **Managing risk:** Collaboration is important, knowledge a crucial driver

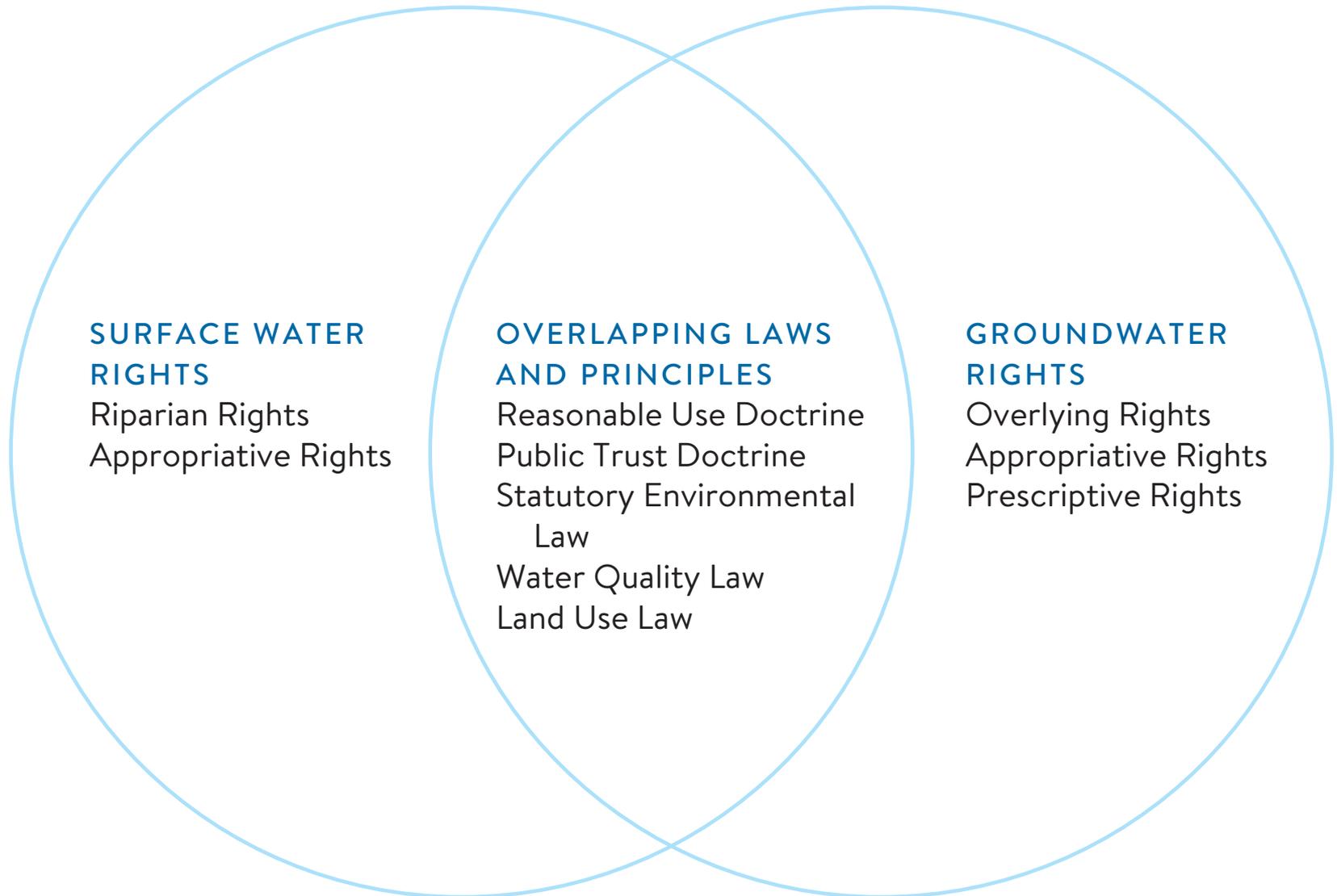
Kumbaya ideal



Unsettled reality



It's not just about SGMA



General Institutional Roles

GSA - Planning and implementation

DWR - Assistance and oversight

SWRCB – Enforcement

Stakeholders and other agencies

- Engagement and specific responsibilities



Example – Instream Flow Requirements

CDFW – Develop instream flow requirements (ISF)

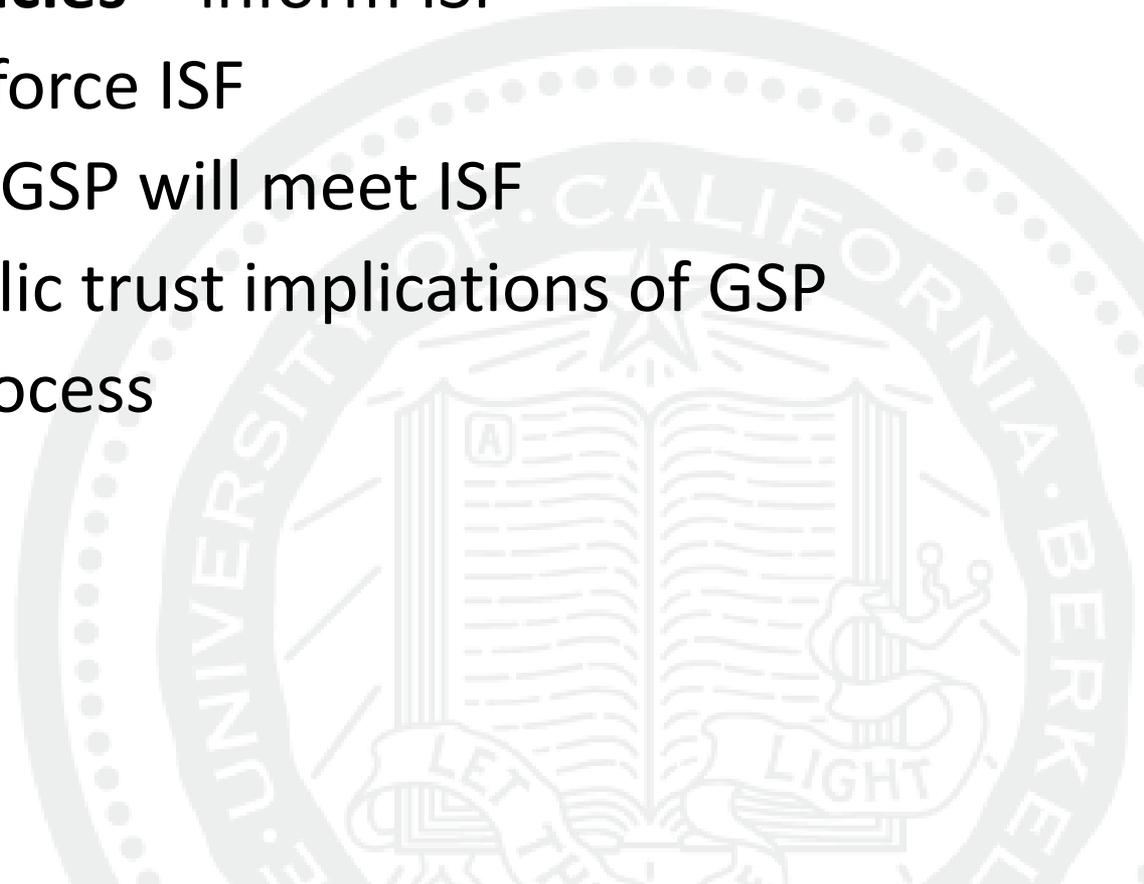
Federal wildlife agencies – inform ISF

SWRCB – Set and enforce ISF

GSA – Consider how GSP will meet ISF

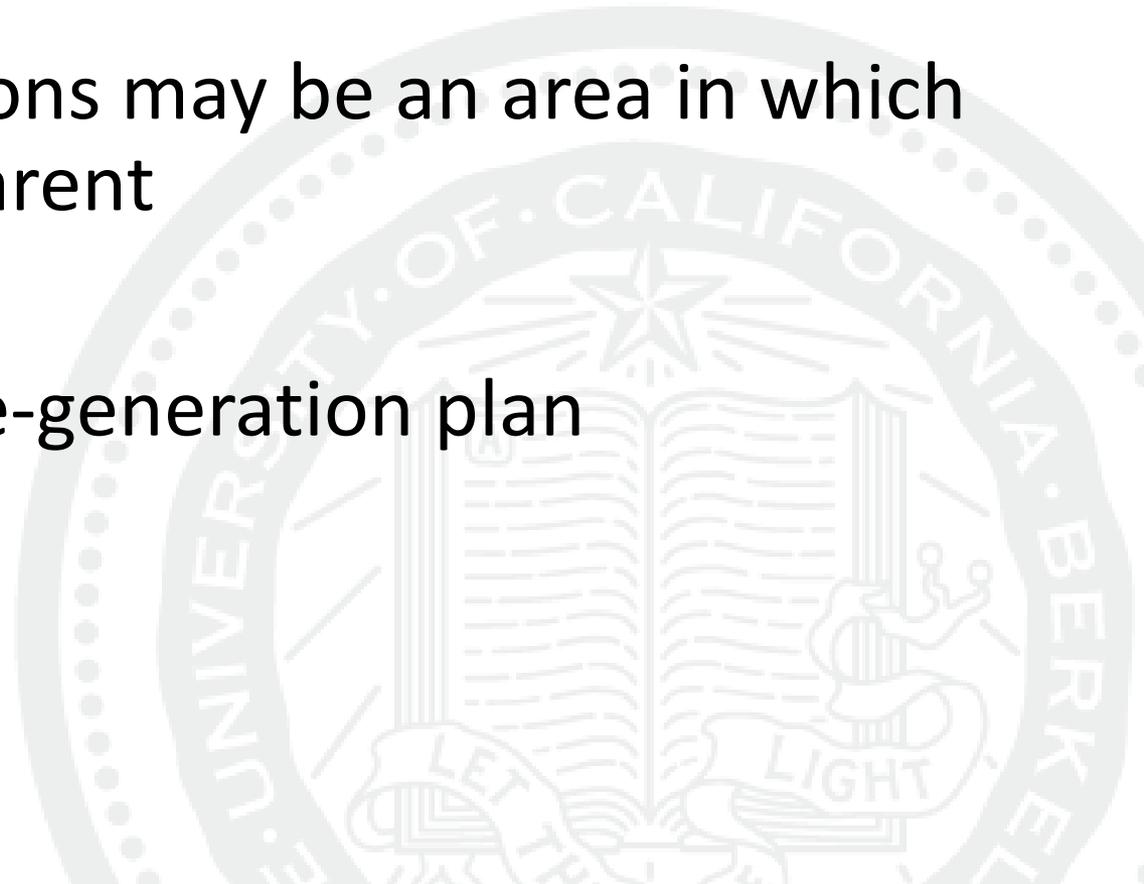
DWR – Consider public trust implications of GSP

NGOs – Engage in process



Approach 1: A risk perspective

- Every GSA should weigh a range of interests in its decisions
- GW-SW interactions may be an area in which discretion is apparent
- Straw man: a one-generation plan



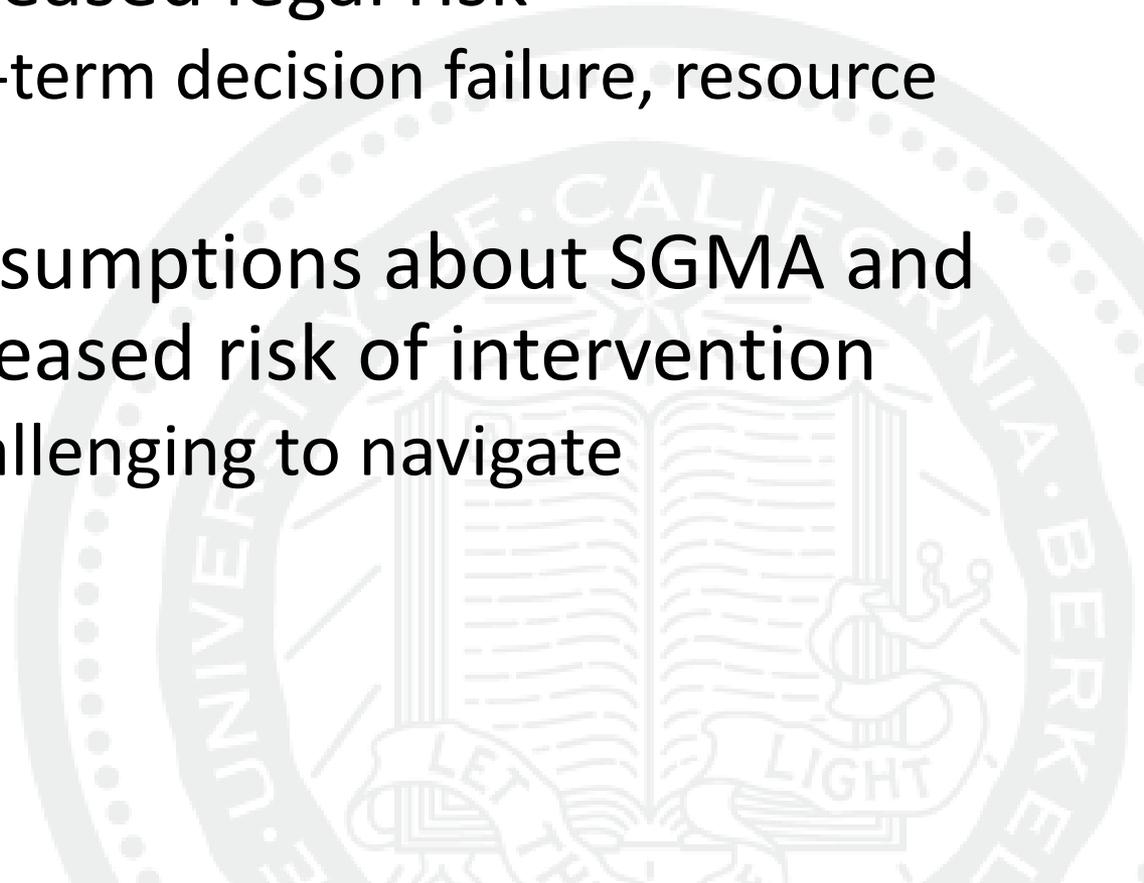
Approach 2: Deliberation and collaboration

1) Assume legitimacy of stakeholder interests and access -> decreased legal risk

- but... risk of near-term decision failure, resource intensive

2) Conservative assumptions about SGMA and other laws -> decreased risk of intervention

- but... may be challenging to navigate



Approach 2: Deliberation and collaboration

3) Robust monitoring and modeling -> defensible GSP and avoided surprises,

- but... resource intensive, possible technical limitations,

4) Work collaboratively with stakeholders and regulators -> defensible GSP, avoided surprises, win-win potential

- but... high upfront costs, risk of decision failure

Knowledge is central: tools and methods

Groundwater level monitoring near streams

Stream flow gaging and hydrograph analysis

Seepage meters

Water balance

Analytical modeling: stream-depletion function

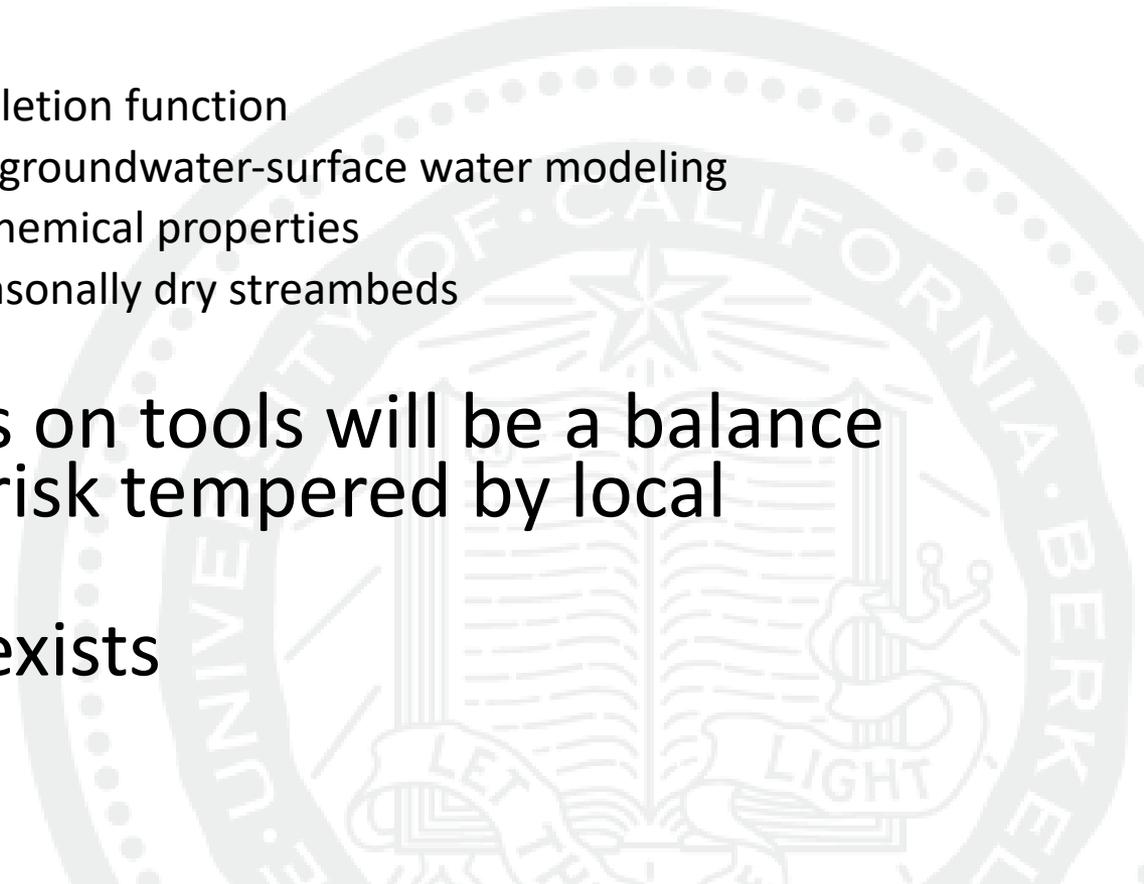
Numerical modeling: integrated groundwater-surface water modeling

Monitoring of physical and geochemical properties

Mapping GDEs, streams, and seasonally dry streambeds

For GSAs, decisions on tools will be a balance between cost and risk tempered by local conditions

No generic recipe exists



Conclusions: practical implications

- **Technical knowledge:** GSAs must strive to understand how groundwater management affects surface water and its uses.
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- **Decision-making under uncertainty:** GSAs must decide what is significant and unreasonable, and these local decisions will intersect with other laws.
- **Planning responsibility under risk:** GSAs will need to develop management plans and make decisions despite substantial legal and technical uncertainties
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Unanswered questions for implementation of the Sustainable Groundwater Management Act

Michael Kiparsky, Director, Wheeler Water Institute, Center for Law, Energy & the Environment, UC Berkeley School of Law

California is grappling with the implications of the Sustainable Groundwater Management Act (SGMA), a visionary and potentially revolutionary law that could profoundly change the way water is managed in the state. The nature of the revolution, however, is not yet clear. Whether and how SGMA achieves its goals hinges on open questions about its implementation.

Groundwater accounts for between one-third and two-thirds of California's water use in a given year and serves as a lifeline when surface water runs low during drought. In part because of California's historical lack of groundwater use regulation, this crucial resource is threatened. In some areas, declining groundwater levels have caused the land surface to subside at a rate of more than one inch per month, damaging roads, canals and pipelines. Falling water tables are driving a well-drilling race that threatens farms, communities and ecosystems.

To address the problem of chronic groundwater

unreasonable" (1) lowering of groundwater levels, (2) reduction in groundwater storage, (3) seawater intrusion, (4) water quality degradation, (5) land subsidence and (6) impacts on beneficial uses of interconnected surface waters.

In concept, this forward-thinking framing aligns the requirements of the law with the impacts of unsustainable groundwater use and the actions needed to address these impacts.

To accomplish these objectives, SGMA relies primarily on local control, with an enforcement backstop provided by the State Water Resources Control Board. New local entities called groundwater sustainability agencies (GSAs) will do the bulk of the work of implementing SGMA by developing, implementing and updating groundwater sustainability plans (GSPs). A GSP provides the template for achieving sustainable groundwater management in a GSA's jurisdiction within 20 years. GSAs must be formed by 2017 and GSPs completed by 2020 or 2022.



JUNE 2017

Trading Sustainably:

CRITICAL CONSIDERATIONS FOR LOCAL GROUNDWATER MARKETS UNDER THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT

Nell Green Nylen, Michael Kiparsky, Kelly Archer, Kurt Schnier, and Holly Doremus



Article

The Importance of Institutional Design for Distributed Local-level Governance of Groundwater: The Case of California's Sustainable Groundwater Management Act

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Abstract: In many areas of the world, groundwater resources are increasingly stressed, and unsustainable use has become common. Where existing mechanisms for governing groundwater are ineffective or nonexistent, new ones need to be developed. Local level groundwater governance provides an intriguing alternative to top-down models, with the promise of enabling management to better match the diversity of physical and social conditions in groundwater basins. One such example is the Sustainable Groundwater Management Act (SGMA) in California. This article examines the institutional design of SGMA and discusses the challenges of implementing a distributed governance system. It argues that the success of SGMA will depend on the ability of local groundwater sustainability agencies (GSAs) to develop and implement groundwater sustainability plans (GSPs) that are tailored to local conditions and that are consistent with the state's overall groundwater management goals.

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DATA
FOR
WATER
DECISION
MAKING

Informing the Implementation of

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For more information (including our report)

law.berkeley.edu/gw-sw

Bringing California Water into the 20th Century

